

DOMCom PC Installation Instructions

John Jacobsen
jacobsen@rust.lbl.gov



Lawrence Berkeley National Laboratory

Version 1.7
November 13, 2001

This document describes the configuration of the six DOMCom PCs used in the DAQ for AMANDA's String 18 at the South Pole. Five DOMCom PCs are to be deployed at Pole, and one is to remain at LBNL for testing. These PCs each contain 8 DOMCom boards. The DOMCom boards enable communications with the string of Digital Optical Modules (DOMs) deployed in the ice at the South Pole.

Look for updated versions of this document at

http://rust.lbl.gov/~jacobsen/docs/installation_of_domcom_machines.pdf and
http://rust.lbl.gov/~jacobsen/docs/installation_of_domcom_machines.doc

Table of Contents

Hardware Preparation	1
BIOS Settings	1
Linux Installation	1
Linux Configuration	2
DOMCom Driver Software Installation.....	2
Additional software installation	3
Current Status	4
Appendix - BIOS Settings	6

Hardware Preparation

Rearrange hardware inside:

Make 8 contiguous ISA slots (move parallel connector to PCI area).

Cable IDE hard disk to primary IDE controller; cable CD-ROM drive to secondary. Make sure both are jumpered as master devices.

We replaced the passive backplanes on most and power supplies on all five units destined for Pole.

Important: Before installing in the rack, open the cover of the PCs and verify that no cables are blocking any fans from turning.

When cover is closed, power on. Hit “Del” key right away to change the BIOS settings.

BIOS Settings

BIOS Update 1: Free IRQ 10 in BIOS by setting its IRQ handling to be “Legacy ISA” rather than ISA/PnP:

Select PNP/PCI CONFIGURATION

Set “Resources Controlled by:” to Manual

Set “IRQ 10 Controlled by” to “Legacy ISA”

We will need IRQ 10 for the DOMCOM Device Driver (tb).

BIOS Update 2: Change BIOS to boot from CD:

Select BIOS FEATURES SETUP

Select Boot Sequence

Select CDROM,C,A

BIOS Update 3: In “Integrated Peripherals,” make sure

Serial1 is 3F8/IRQ4

Serial2 is 2F8/IRQ3

Also make sure IR port is disabled (just below serial settings in the same menu)

Exit and save BIOS settings.

See the Appendix on BIOS Settings for screen shots of a working machine.

Linux Installation

Boot RedHat 7.1 install disk.

Select default option by typing return

(If blue screen appears with no further change in > 60 seconds, hit the reset button and try again)

Choose defaults until you get to the “Install Options” screen.

Then choose “custom system” installation.

Partition manually with Disk Druid

Delete existing DOS partition

Add the following partitions:

/boot	38 MB	Linux native
/	6000 MB	Linux native
swap	256 MB	Linux swap
	1024 MB	FAT (for DOS) (leave mount point blank)
/home	(use remaining)	Linux native

Click on Next. Select all available partitions to format. Check “check for bad blocks”. Click on Next.

LILO configuration: use defaults

Network configuration: use defaults (DHCP)

Firewall: choose no firewall

Timezone info – I chose California, but this should probably be UTC eventually.

Set root password. Create DOM account with user dom.

Authentication – choose defaults

Package installation – choose the following:

- Printers
- X-Windows
- Gnome
- Mail/WWW/News
- DOS/Windows connectivity
- Networked workstation
- Dialup workstation (for minicom)
- Anonymous FTP
- Emacs
- Development
- Kernel development
- Utilities

X-Configuration: choose defaults for the screens, however in the “Custom Configuration,” select “text login” rather than “Graphical.”

Click next twice and wait for awhile while software packages are installed. You’ll have to change CDs once.

Linux Configuration

Let the system reboot.

Log in as dom.

Run `/sbin/ifconfig`. Read the `Hwaddr` field. It should be something like “00:E0:4C:51:00:A3”.

This is the MAC address. Write it on the front panel. Also see below for the MAC addresses.

Change shell to `tcsh` using the program `chsh`.

Scp `.cshrc` from another installed host to dom account.

Scp `.bashrc` from another installed host to root account.

Log out and log in again (to activate new shell) or type “`/bin/tcsh`”

Disable unneeded and possibly insecure services:

Sendmail, portmap, nfslock:

`su`

`/sbin/chkconfig --level 012345 sendmail off`

`/sbin/chkconfig --level 012345 portmap off`

`/sbin/chkconfig --level 012345 nfslock off`

DOMCom Driver Software Installation

Set up the FPGA area in the DOM account (used to store working versions)

`su dom`

`mkdir /home/dom/fpga`

scp the FPGA designs from another machine to this directory

Set up the software release directories:

`su`

`mkdir /usr/local/dom`

```
chown dom /usr/local/dom.  
su dom  
cd /usr/local/dom  
mkdir bin lib driver fpga  
mkdir bin/backup lib/backup
```

Get the driver, syncserver software, etc.:

```
Change back to the dom home directory with "cd"  
cvs checkout domsoft
```

Build the driver:

```
su dom  
Change to the driver directory: "cd ~/domsoft/src/driver"  
make  
su, then make install
```

Build syncserver, dataserver:

```
su dom  
Change to the portio directory: "cd ~/domsoft/src/portio"  
make  
make install
```

Make sure tbrc (the startup script for syncserver, dataserver and the driver) is in /etc/rc.d/init.d:

```
su  
/sbin/chkconfig --list | grep tbrc  
Assuming it's there, turn it on for the normal runlevels:  
/sbin/chkconfig --level 345 tbrc on
```

Create the device files /dev/tb*:

```
su  
mknod /dev/tb0 c 88 0  
mknod /dev/tb1 c 88 1  
mknod /dev/tb2 c 88 2  
mknod /dev/tb3 c 88 3  
mknod /dev/tb4 c 88 4  
mknod /dev/tb5 c 88 5  
mknod /dev/tb6 c 88 6  
mknod /dev/tb7 c 88 7  
chmod 0666 /dev/tb*
```

Reboot; log in as dom; su; watch the system log with tail -f /var/log/messages; connect using domtalk from outside, see if test board driver (tb), syncserver and dataserver show up in the system log.

Additional software installation

Installation of minicom: copy minicom-1.83.1-8.i386.rpm from Jacobsen's account on rust.
rpm -ivh minicom-1.83.1-8.i386.rpm

Run it as root, create initialization file:

```
minicom -s com1
```

Enter serial port setup

Change as follows:

```
Serial device -> /dev/ttyS0
Lockfile -> /var/lockS0
Hardware flow control -> no
chmod o+rw /dev/ttyS0
chmod o+rw /dev/ttyS1
```

Current Status

Hardware swapped in all machines for Pole.

<u>Machine</u>	<u>new backplane</u>	<u>new psupp</u>	<u>gps works</u>	<u>domcom works</u>
Tbdaq-1	yes	yes	yes	yes
Tbdaq-2		yes	yes	yes
Tbdaq-3		yes	yes	yes
Tbdaq-4		yes	yes	yes
Tbdaq-5	yes	yes	yes	yes
Tbdaq-6	swapped to old type	no	yes	yes

Earlier notes:

Tbdaq-1 is loaded. Driver, dataserver and syncserver are loaded. System is ready to test w/ DOMCom boards. Tbdaq-1 has “DMA Interrupt Errors” associated with the hard disk. They seem to not actually cause any problems. We swapped CPUs, CDs and hard disks with another unit which did not seem to fix the problem. The errors don’t seem to affect anything, so we are shipping the unit as is.

Tbdaq-2 seems flaky. System crashed twice during install. After changing the host name in the network setup, gnome crashed and now it doesn’t even boot at all.

Try reinstall. Tried many things. Basically nothing worked with this CPU board. Installed ok using board from system 2.

Reinstalled using CPU 6. CPU 6 is now CPU 2. MAC and IP addresses below updated. System 2 looks ok.

Tbdaq-3 – install going ok. Nuke install during testing of other flaky units. Reinstall ok. Driver software up to date as of 10/17/01.

Tbdaq-4 – when selecting partitioning method, setup crashes and tells me it’s ok to reboot the system.

Recabled system so that CD and disk are both master on their own IDE bus. Disk gets primary, CD gets secondary. Installation proceeds ok at that point. Software installed and up to date as of 10/17/01.

Tbdaq-5 – no problems.

Tbdaq-6 – had trouble with CD media during install. Cleaned CD. Seemed ok. Still should cable 2nd IDE bus. First or second startx froze. Startx worked after that. Will watch.

Swapped CPU out into 2. Will wait for new CPU. Install on disk should be ok.

11/9/01 got new CPU in there – works like a charm.

MAC addresses:

tbdaq-1 MAC address: 00:E0:4C:56:00:1F
tbdaq-2 MAC address: 00:E0:4C:55:00:20
tbdaq-3 MAC address: 00:E0:4C:51:00:A3
tbdaq-4 MAC address: 00:E0:4C:56:00:20
tbdaq-5 MAC address: 00:E0:4C:51:00:67

These are fixed by the hardware.

Appendix - BIOS Settings

These were taken from tbdag-6, which is the DOMCOM PC which is staying at LBNL.

Version information

Award Modular BIOS v4.51PG, An Energy Star Ally
Copyright (C) 1984-2000, Award Software, Inc.

A-675 VER:1.1

Changeable BIOS Settings (not in order)

This is the most important screen - you have to change the setting for IRQ 10 in order for the device driver to work:

ROM PCI/ISA BIOS (2A51MTPK)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

Resources Controlled By : Manual Reset Configuration Data : Disabled	PCI IRQ Activated By : Level
IRQ-3 assigned to : PCI/ISA PnP IRQ-4 assigned to : PCI/ISA PnP IRQ-5 assigned to : PCI/ISA PnP IRQ-7 assigned to : PCI/ISA PnP IRQ-9 assigned to : PCI/ISA PnP IRQ-10 assigned to : Legacy ISA IRQ-11 assigned to : PCI/ISA PnP IRQ-12 assigned to : PCI/ISA PnP IRQ-14 assigned to : PCI/ISA PnP IRQ-15 assigned to : PCI/ISA PnP DMA-0 assigned to : PCI/ISA PnP DMA-1 assigned to : PCI/ISA PnP DMA-3 assigned to : PCI/ISA PnP DMA-5 assigned to : PCI/ISA PnP DMA-6 assigned to : PCI/ISA PnP DMA-7 assigned to : PCI/ISA PnP	ESC : Quit ↑↓←→ : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults

ROM PCI/ISA BIOS (2A5IMTPK)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Mon, Nov 12 2001							
Time (hh:mm:ss) : 17 : 8 : 53							
HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR MODE
Primary Master	: Auto	0M	0	0	0	0	0 AUTO
Primary Slave	: Auto	0M	0	0	0	0	0 AUTO
Secondary Master	: Auto	0M	0	0	0	0	0 AUTO
Secondary Slave	: Auto	0M	0	0	0	0	0 AUTO
Drive A : 1.44M, 3.5 in.				Base Memory: 640K Extended Memory: 261120K Other Memory: 384K <hr/> Total Memory: 262144K			
Drive B : None							
Floppy 3 Mode Support : Disabled							
LCD&CRT : Auto							
Halt On : No Errors							
ESC : Quit		↑ ↓ → ← : Select Item		PU/PD/+/- : Modify			
F1 : Help		(Shift)F2 : Change Color					

Changing the “Boot Sequence” setting as shown below allows one to boot from CD-ROM during installation or upgrade of the operating system.

ROM PCI/ISA BIOS (2A5IMTPK)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning : Disabled CPU Internal Cache : Enabled External Cache : Enabled Quick Power On Self Test : Enabled Boot Sequence : CDROM,C,A Swap Floppy Drive : Disabled Boot Up Floppy Seek : Enabled Boot Up NumLock Status : Off Memory Parity Check : Disabled Typematic Rate Setting : Disabled Typematic Rate (Chars/Sec) : 6 Typematic Delay (Msec) : 250 Security Option : Setup PCI/UGA Palette Snoop : Disabled Assign IRQ For VGA : Enabled OS Select For DRAM > 64MB : Non-OS2 Report No FDD For WIN 95 : Yes	Video BIOS Shadow : Enabled C8000-CBFFF Shadow : Disabled CC000-CFFFF Shadow : Disabled D0000-D3FFF Shadow : Disabled D4000-D7FFF Shadow : Disabled D8000-DBFFF Shadow : Disabled DC000-DEFFF Shadow : Disabled Cyrix 6x86/MII CPUID: Enabled
ESC : Quit ↑↓→← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults	

ROM PCI/ISA BIOS (2ASIMTPK)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Refresh Rate Control : 15.6us	Video BIOS Cacheable : Disabled
Ref/Act Command Delay : 6T	Memory Hole at 15M-16M : Disabled
Refresh Queue Depth : 12	PCI Post Write Buffer : Disabled
RAS Precharge Time : 3T	PCI Delayed Transaction : Disabled
RAS to CAS Delay : 3T	
ISA Bus Clock Frequency : PCICLK/4	
Starting Point of Paging: 1T	
L2 Cache Burst RD Cycle : Delay 1 T	
Asyn/Sync Mode CPU/DRAM : Asynchronous	
SDRAM CAS Latency : 3T	
SDRAM WR Retire Rate : X-2-2-2	
DRAM Opt RAS Precharge : Disabled	
PCI Peer Concurrency : Disabled	
Read Prefetch Memory RD : Enabled	
Assert TRDY After Prefet: 2 QWs	ESC : Quit ↑↓→← : Select Item
CPU to PCI Burst Mem. WR: Disabled	F1 : Help PU/PD/+/- : Modify
CPU to PCI Post Write : Disabled	F5 : Old Values (Shift)F2 : Color
AGP Aperture Size : 64MB	F6 : Load BIOS Defaults
System BIOS Cacheable : Disabled	F7 : Load Setup Defaults

ROM PCI/ISA BIOS (2ASIMTPK)
CPU FEATURES SETUP
AWARD SOFTWARE, INC.

Current CPU Temperature : 61°C/141°F	
Current CPUFAN1 Speed : 0 RPM	
IN0(V): 11.71 V IN1(V): 5.00 V	
IN2(V): 3.36 V IN3(V): 2.23 V	
	ESC : Quit ↑↓→← : Select Item
	F1 : Help PU/PD/+/- : Modify
	F5 : Old Values (Shift)F2 : Color
	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

Some of the machines were shipped with power management settings which would cause the machines to go into standby mode after four hours. The following settings should remove this possibility:

ROM PCI/ISA BIOS (2A51MTPK)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

ACPI function : Disabled	VGA Activity : Enabled
Power Management : User Define	IRQ [3-7,9-15],NMI : Enabled
Video Off Option : Susp,Stby -> Off	IRQ 8 Break Suspend : Disabled
Video Off Method : U/H SYNC+Blank	
Switch Function : Break/Wake	
Doze Speed (div by): 2/8	
Stdbby Speed(div by): 1/8	
MODEM Use IRQ : 3	
Hot Key Function As: Power Off	
** PM Timers **	
HDD Off After : 15 Min	
Doze Mode : Disable	
Standby Mode : Disable	
Suspend Mode : Disable	
** PM Events **	
HDD Ports Activity : Enabled	ESC : Quit ↑↓↓+ : Select Item
COM Ports Activity : Enabled	F1 : Help PU/PD/+/- : Modify
LPT Ports Activity : Enabled	F5 : Old Values (Shift)F2 : Color
	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

ROM PCI/ISA BIOS (2A51MTPK)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

Internal PCI/IDE : Both	Onboard Parallel Port : 378/IRQ7
IDE Primary Master PIO : Mode 0	Parallel Port Mode : SPP
IDE Primary Slave PIO : Mode 0	
IDE Secondary Master PIO: Mode 0	PS/2 mouse function : Enabled
IDE Secondary Slave PIO: Mode 0	USB Controller : Enabled
Primary Master UltraDMA: Disabled	USB Keyboard Support : Disabled
Primary Slave UltraDMA: Disabled	Init Display First : PCI Slot
Secondary Master UltraDMA: Disabled	
Secondary Slave UltraDMA: Disabled	
IDE Burst Mode : Disabled	LCD Panel Type : Panel 0
IDE Data Port Post Write: Disabled	
IDE HDD Block Mode : Disabled	
ACPI Disable Method : Disabled	ESC : Quit ↑↓↓+ : Select Item
Onboard FDC Controller : Enabled	F1 : Help PU/PD/+/- : Modify
Onboard Serial Port 1 : 3F8/IRQ4	F5 : Old Values (Shift)F2 : Color
Onboard Serial Port 2 : 2F8/IRQ3	F6 : Load BIOS Defaults
IR Address Select : Disable	F7 : Load Setup Defaults